

REMARKS

Claim Amendments:

The claims have been amended as follows:

Claim 4 has been amended to more clearly define the invention. Support for the new material can be found on pages 32, and 34-38 of the original description.

Claims 19 has been amended to introduce a "gateway database server".

Claims 19 and 20 have been combined into a single claim 20.

Claim 20 has been cancelled

Claim 38 has been amended to more clearly define the invention. Support for the new material can be found on page 49, lines 17 – 23.

Claim Objections

The Examiner objected to claim 21 for reciting a dependence on a cancelled claim. Claim 21 has been amended to depend on claim 10. Applicant submits that Claim 21 is now in an allowable state.

The Examiner objected to claim 22 for depending on unallowable claim 21. Claim 21 has been amended as above and, Applicant submits that claim 22 is now in an allowable state.

Claim Rejections – 35 USC 112

The Examiner rejected claims 1, 23, and 38 under 35 USC 112 as allegedly not being fully supported by the written description.

Claims 1 and 23 claimed placing the data manager at a middle tier of a three-tier architecture. The Summary of the Invention has been amended so as to contain the wording used in these claims. One skilled in the art would have reasonably inferred this material from, at least Figures 3-5 as originally filed. It is clear that the drawings describe a three-tier architecture, and that such an architecture was commonly known to one skilled in the art, as the Examiner pointed out by way of the website article "Three Tier Software Architecture, Software Technology Roadmap" (referred to as the SEI website) (www.sei.cmu.edu/str/descriptions/threetier_body.html). Applicant submits that claims 1 and 23 now comply with 35 USC 112.

The Examiner further rejected claim 1 for the use of the term "arbitrating". Although the term is not explicitly used in the description the Applicant respectfully submits that there is support in the description for interpreting 'arbitrating' as its definition in the Myriam Webster Dictionary. "Arbitrate" is defined as deciding or selecting a course of action. Taken in this sense there is support in the description for one skilled in the art to properly determine the meaning of the data manager arbitrating flight data, system data, and airport data transactions.

Claims 1 and 38 used the term "non-intrusive". The Examiner states that one skilled in the art would not have been able to reasonably determine the meaning of this term from the specification presented. Myriam Webster defines "intrusive" as "the act of wrongfully entering upon, seizing, or taking possession of the property of another". This language is supported on page 49 of the claim where it discloses the requirement to prevent unauthorized access to the IIDS LAN. Furthermore, the use of the words "intrusions" and "intruders" are well known to one skilled in the art of firewalls, and as such the meaning of nonintrusive could be reasonably inferred. As such, Applicant respectfully submits that the generally accepted meaning in the relevant art of the term "non-intrusive" would be obvious to one skilled in the art, and that this meaning is fully supported in the specification.

Claim Rejections – 35 USC 103

The Examiner has cited the following references in the Official Action mailed on June 8, 2006:

Glass et al (US 6,161,097) referred to as Glass (I)

Glass et al (US 6,278,965) referred to as Glass (II)

Hensey et al (US 2003/0109973) referred to as Hensey

Spencer, JR (US 2002/0188610) referred to as Spencer

“Three Tier Software Architecture, Software Technology Roadmap”

(www.sei.cmu.edu/str/descriptions/threetier_body.html) referred to as SEI website

Mukhopadhyay et al (US 6,032,158) referred to as Mukhopadhyay

Raz (US 6,292,827) referred to as Raz

Bowman-Amuah (US 6,615,253) referred to as Bowman-Amuah

Glass (I)

Glass (I) discloses a traffic management system. “The system may be configured to as a real-time airport *surface traffic management system*, that electronically interconnects air traffic control, airline data, and airport operations data to facilitate information sharing and *improve taxi queuing*.” (Abstract, emphasis added)

Hensey

Hensey discloses an invention that “is directed at solving problems associated with the completion and return of aircraft operational data and/or *technical log data*. In particular, the present invention provides an aircraft data collection device for use by a plurality of users” (Abstract, emphasis added).

Spencer

Spencer discloses an invention that “comprises a scalable data delivery system including a plurality of application servers, web servers and data servers.” Further “the invention creates distribution and management services that *facilitate extreme*

distribution of a software solution to the degree that it can be installed and managed behind a client's firewall.”(para. 62, emphasis added)

SEI Website

The website discloses the general characteristics of a three-tier distributed client/server architecture.

Claim 1:

The Examiner has rejected claim 1 as being obvious with respect to Glass (I), Hensey, Spencer, and the SEI website.

As outlined above, Glass (I) discloses a Traffic Management System. The system provides for the interconnection of multiple data sources, such as air traffic control, airline data and airport operations data. By connecting these data sources to a single point, the system taught by Glass (I) is able to facilitate information sharing, with a goal being improving taxi queuing. As has been previously submitted in the communication of October 31, 2003, and which the Examiner accepted in the Official Action mailed on June 8 2006, the system taught by Glass (I) is of an archaic client/server architecture. While this architecture provides real-time data processing for the system disclosed by Glass (I), it cannot do so for the number of users required in an air traffic control (ATC) system. As is known to one skilled in the art, the data-centric client/server architecture does not provide real-time processing when scaled to a larger number of users. This is one of the problems addressed by the current application.

On page 4 of the Official Action, the Examiner stated that in column 5, lines 18-35 Glass (I) discloses, a data manager including “a first database server connected to the data manager”. Glass (I), in fact, discloses a TMS (Traffic Management System) that “is data-driven, database table accesses or value changes trigger messages”. Applicant submits that this does not obviously lead one skilled in the art to the Data Manager of the current application. The Data Manager of the current application is “placed at the middle tier of a three-tier architecture, the data manager for arbitrating

flight, system and airport data transactions in a *performance-related* manner”(Claim 1, emphasis added). As outlined above, the TMS of Glass (I) uses client/server architecture, which cannot be scaled to support the number of users and still provide performance related, real-time processing as required in an air traffic control environment. By placing the Data Manager in the middle tier of a three-tier architecture, the system is able to process in real time the large number of clients required in an air traffic control environment.

On page 5 of the Official Action mailed on June 8, 2006, the Examiner stated that Glass (I) “fails to disclose the use of a three-tier architecture with the data manager being placed at the middle tier for arbitrating flight, system and airport data transactions.” The Examiner continues “Hensey et al discloses a three-tier system for collecting data for use by a plurality of users having an associated security level. (Page 2, paragraphs 26-32; Figure 1)”. Applicant respectfully submits that the system taught by Hensey does not overcome the deficiencies of Glass (I) as outlined above. Furthermore, Hensey does not disclose a three-tier system, nor in particular, a middle tier for “arbitrating flight, system and airport data transactions” (Claim 1). While Hensey does describe a multi-tiered system, it cannot be considered as a three-tiered system as discussed in the SEI website. The system disclosed by Hensey is designed for Internet access to a data store (Figure 1). Hensey describes the server as “using Client/Server model, with Internet technology” (paragraph 90). Applying the system architecture of Hensey to the system of Glass (I), would not lead one skilled in the art to the subject matter of the current application. Neither Glass (I) nor Hensey teach towards providing a data manager in a middle tier for arbitrating transactions.

On page 5 of the Official Action, the Examiner stated that Hensey “discloses a gateway server for moving data from a secure domain to a less secure domain in a non-intrusive manner”. While Hensey does disclose a Gateway server, it is not intended for moving data from a more secure domain to a less secure domain. The Gateway server of Hensey is an XML Gateway Server, and is intended for parsing XML messages into blocks to be stored in the data store, and for checking the integrity of XML messages sent over the internet connection (paragraphs 191 – 192).

The Examiner states that “It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Glass (I) to be a three-tier system taught by Hensey”. As outlined above Hensey does not teach a three-tier system. Hensey does not disclose any information that overcomes the deficiencies of Glass (I); which, are addressed in the current application. The Examiner goes on to state that the web site discloses using a three-tier architecture over a two-tier architecture. However, the general system requirements taught by the website are not enough for one skilled in the art to arrive at the current subject matter from the teachings of Glass (I), alone or in combination with Hensey. The Examiner further states that Spencer discloses the use of firewalls to protect data. Spencer discloses a system that can be used with a firewall, which does not anticipate the specific firewall of the current application, which allows data to move in only one direction.

For the reasons outlined above, Applicant respectfully submits that the subject matter of claim 1 is patentable over Glass (I) with respect to Hensey, Spencer and the SEI Website. Applicant submits that claims 2 – 22, which are dependent on claim 1 and serve to further limit the scope of claim 1 which is submitted to be in an allowable state, are in an allowable state as well.

Claim 4:

The Examiner has rejected claim 4, stating “Glass (I) et al discloses at least one of the plurality of clients is a workstation having a display screen. (Column 7, lines 39 – 40)” Claim 4 has been amended to more clearly claim the invention. Claim 4 is dependent on claim 1, and serves to further define the scope of the invention. Applicant submits that claim 1 is in an allowable state, therefore claim 4 is also in an allowable state.

Claim 5:

The Examiner has rejected claim 5, stating “Glass (I) et al discloses the plurality of second interfaces each include a server data manager. In the information subsystem integrates other subsystems and provides inter-process management and

control (Column 6, lines 45-53).” On lines 45-53 Glass (I) is describing the information subsystem, which among other things provides for process management. Applicant submits that this is not the subject matter of claim 5. The subject matter of claim 5 pertains to the communication mechanism. Applicant submits that embedding a client data manager and server data manager object within any client process is a unique communication scheme.

Claim 7:

The Examiner has rejected claim 7 in view of Glass (I) and Hensey, stating, “Glass (I) et al discloses the data manager includes a flight data entry object list. The Client interface subsystem includes an interface for continuously displaying flight data”(Column 7, lines 13-16). However, Glass (I) further describes the client interface subsystem as containing a ci_data program that “ synchronously reads flight data from the databases and passes the data *without interpretation to all connected client programs*” (Column 22, lines 30 – 33, emphasis added). It can be appreciated that this differs from the subject matter of claim 7. The data manager of claim 7 maintains, among other functions, a dynamically updated connection list in the middle tier of a three-tier system. As has been previously outlined, Glass (I) does not disclose such a list. Further Glass (I) teaches sending data to all connected client connections, while the system as claimed in claim 1 which claim 7 depends on, claims that the data manager sends the data to clients based on a subscription list.

The Examiner further suggests that “Hensey et al discloses the data manager maintains passes and receives lists of data entries, system information and dynamically updated connection lists, as a streamed object via a streamed socket connection. (Page 15, paragraph 226)” Hensey sends data as XML data. While the flight data could be sent using XML, it is not appropriate to do so in an ATC system, as the data would require the use of an XML parser which would negatively impact performance. Furthermore, Hensey does not send data as streamed objects, but as clear text (paragraph 226).

For the reasons outlined above, Applicant respectfully submits that claim 7 contains subject matter that is patentable over Glass (I) in view of Hensey.

Claims 11 – 13

The Examiner has rejected claims 11 – 13 stating that “Glass (I) et al discloses that the tables include flight plan table, radar track table, airline event table, flight info table, and airline schedule table.” Both the system as taught by Glass (I) and the current application store flight data; however, the requirements for storing the data and the method by which they are stored are different. The Glass (I) system stores data to 5 tables depending on external inputs, while the system of the current application stores only processed data into 3 different tables, which are then transacted to 3 permanent tables. Furthermore Glass (I) discloses separating the flight data into two different tables, one for arrivals and one for departures. This is different than the system of the current application, which groups all flight data together in one table. For the reasons stated above, Applicant submits that claims 11 – 13 contain patentable subject matter over Glass (I)

Claim 23

The Examiner has rejected claim 23 stating that it “would have been obvious to one having ordinary skill in the art at the time of the invention to modify Glass (I) et al to be a three-tier system as taught by Hensey et al.” As has been outlined above, Hensey does not teach a three-tier system that could be applied to the system taught by Glass (I). The Examiner continues, “it is known in the art that a three-tier architecture is used to provide increased performance flexibility, maintainability, reusability and scalability, as discussed on the website (paragraph2).” Applicant submits that while the idea of applying a three-tier architecture to Glass (I) may have been obvious, the technical solutions to the numerous problems are not suggested by the website, or Hensey. It is known to those skilled in the art that it is more difficult to modify an archaic system to a new architecture than it is to design a new system.

The Examiner further states that, “it would have been obvious to include the teachings of Spencer, JR with the invention of Glass (I) et al in order to be able to generate an error when information was not received.” Applicant submits that Spencer does not disclose a method of generating errors in order to make communications more reliable, as the subject matter of claim 23 does.

For the reasons outlined above, Applicant respectfully submits that the subject matter of claim 23 is patentable over Glass (I) with respect to Hensey, Spencer and the SEI Website. Applicant submits that claims 24 – 37, which are dependent on claim 23 and serve to further limit the scope of claim 23, which is submitted to be in an allowable state, are also in an allowable state.

Claim 25:

The Examiner has rejected claim 25 stating, “Glass (I) et al discloses the new data is updated in the tables in order to provide the subscribers with the newest information that meet their criteria. Column 17, lines 54-67).” Glass (I) does not disclose that only data determined by a criteria included in the list of subscribers is provided. It can be appreciated that the system taught by Glass (I) would not lead one skilled in the art to the subject matter of claim 25. As such, Applicant submits that claim 25 contains subject matter that is patentable over Glass (I).

Claim 26:

The Examiner rejected claim 26, stating that, “Glass (I) et al discloses the data for the database is stored in database tables. (Column 17, lines 54-67)” Applicant submits that the data stored by Glass (I) is from external inputs, while the data stored according to claim 26 is updated data. This is described on page 48 lines 11 – 15 of the current application. For the reasons outlined above the Applicant respectfully submits that claim 26 contains patentable subject matter over Glass (I). Furthermore, claim 26 is dependent on claim 23, which applicant submits to be in an allowable state, and as such serves to further limit the scope of claim 23.

Claim 28-30

The Examiner has rejected claims 28 – 30 stating that “Glass (I) et al discloses the tables include flight plan table, radar track table, airline event table, flight info table, and airline schedule table.” Both the system as taught by Glass (I) and the current application store flight data; however, the requirements for storing the data and the method in which they are stored is different. The Glass (I) system stores data to 5 tables depending on external inputs, while the system of the current application stores only processed data into 3 different tables, which is then processed to 3 permanent tables. Glass (I) discloses separating the flight data into two different tables, one for arrivals and one for departures. This contrasts the system of the current application which groups all flight data together in one table. Furthermore the data tables of claims 29 and 30, store data unique to the current application. For the reasons stated above, Applicant submits that claims 28 – 30 contain patentable subject matter over Glass (I).

Claim 38:

The Examiner has rejected claim 38 stating “Hensey et al discloses a database system for moving and storing data outside of a secure operational domain (Page 3, paragraph 53).” Claim 38 has been amended to more clearly define the invention. Applicant respectfully submits that the system disclosed by Hensey, which is further described in paragraphs 188-195, does not move and store data outside a secure operational domain. Hensey in fact describes moving and storing information into a more secure domain. Furthermore the system taught by Hensey makes use of security levels to allow users to access information through the firewall. This is in direct contrast to the subject matter of claim 38, which does not allow any user access through the firewall, regardless of security levels.

The Examiner further states Spencer as disclosing the use of a firewall as contained in claim 38 of the current application. However the Spencer firewall is to be configured to allow outside users access to the secure domain. This is an unacceptable security risk in ATC systems. As such neither Hensey nor Spencer, taken individually or in combination, disclose the subject matter of claim 38 of the current application.

Further one skilled in the art would not be led to such material, given the two teachings. Applicant therefore respectfully submits that claim 38 contains patentable subject matter.

Claim 3

The Examiner rejected claim 3 under 35 USC 103(a) as being unpatentable over Glass (I) in view of Glass(II). The Examiner has stated that Glass(II) “discloses an actual input/output server to allow data exchange and common central storage. (Columns 12, lines 1-7)”. Applicant submits, Glass(II) discloses that “external databases and servers work in conjunction with the information subsystem to allow data exchange ... through internet protocols (e.g., object relational brokers such as CORBA).” Applicant submits that Glass(II) does not disclose the subject matter of claim 3, which claims, “one of the plurality of clients is an external input/output server.” An external database that supports CORBA(Common Object Request Broker Architecture) does not teach towards a client being an external input/output server. Furthermore, Glass(II) does not disclose any information that could lead one skilled in the art to overcome the shortcomings of Glass (I), as outlined previously. Applicant therefore respectfully submits that claim 3 contains patentable subject matter.

Claims 10, 14-16,27, and 31 - 37

The Examiner has rejected claims 10, 14-16, 27, and 31 – 37 stating that the claimed subject matter would have been obvious to one skilled in the art by applying the teachings of Mukhopadhyay to those disclosed by Glass (I) . Applicant respectfully submits that one skilled in the art would not be led to apply the teachings of Mukhopadhyay to those of Glass (I). The purpose, requirements and design constraints are different in each case. The system of Mukhopadhyay is useful for ensuring the data stored in large database are kept up to date at various ‘datamarts’. However the design requirements of the database system of the current application does not require that large databases be kept synchronized. The database of the current application is small, and the data is being transferred primarily for security and reliability concerns.

This differs from the Mukhopadhyay system where large databases must be kept synchronized. To accomplish this the Mukhopadhyay system splits new or updated data into static and dynamic images. The dynamic image contains the data that has changed. The dynamic image is sent to the datamarts in order to bring the datamart databases up to data with the current changes. This is contrasted to the subject matter of claims 10, 14 – 16, 27, and 31 – 37, which sends updated data to “snapshot tables”. The “snapshot” of the changed data is saved in its entirety in a new row of the database (paragraph 390). It can be appreciated that this requires different processes and techniques to first create the dynamic table image, and then to update the corresponding database with the new information contained within. The system of the current application does not use the method taught by Mukhopadhyay. The databases of the current system are kept synchronized by sending data corresponding to the entire database. Furthermore the method taught by Mukhopadhyay uses an external process to synchronize the data that is to be written. The system of the current application uses a procedure on the gateway server so as not to affect the reliability of the SQL server. That is, the Gateway server initiates the action so that if it fails it does not adversely affect the operation of the SQL server.

The systems taught by Glass (I) and Mukhopadhyay differ greatly in the specific purposes, requirements, and implementations. Applicant respectfully submits that the expertise required to use the teachings of Mukhopadhyay to overcome the shortcomings of Glass(I) are much greater than the expertise of one ordinarily skilled in the art. For the reasons outlined above in addition to these claims being dependent claims 1 and 23, which applicant submits are allowable, and serving to further limit their scope, Applicant respectfully submits that claims 10, 14-16, 27, and 31 - 37 contain patentable subject matter.

Claim 17:

The Examiner has rejected claim 17 under 35 USC 103(a), stating the claim is “unpatentable over Glass (I) in view of Raz” continuing “...it would have been obvious to one having ordinary skill in the art at the time of the invention to create at least the

first interface to be ODBC since it is what is known and common.” Applicant submits that while claim 17 states that “the first interface is ODBC” it serves to further limit the scope of claim 1, upon which it is dependent. Application of ODBC to the system of the current application is novel, and non-obvious. Applicant submits that claim 1 is in an allowable state, and as such claim 17 is in an allowable state as well. Applicant therefore respectfully submits that claim 17 contains patentable subject matter.

Claims 19-20

The Examiner has rejected original claims 19 and 20 under 35 USC 103(a) as being unpatentable over Glass (I) in view of Mukhopadhyay and Bowman-Amuah. Applicant submits amended claim 19 now contains patentable subject matter over Glass (I) in view of Mukhopadhyay and Bowman-Amuah. Applicant therefore submits that claim 19 contains patentable subject matter.

Description Amendment:

The Description has been amended to use wording of the claims. The amended subject matter is supported by Fig. 3 and Fig 4, which show, at least, the data manager in the middle of a three-tier system architecture and a gateway server connected to a database server through a firewall.

CONCLUSION

In view of the forgoing amendments and the remarks, and having dealt with all the objections raised by the Examiner, reconsideration and allowance of the application is courteously requested.

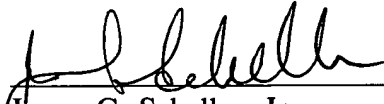
Deposit Account Authorization

Authorization is hereby given to charge our Deposit Account No. 02-2666 for any charges that may be due.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR
& ZAFMAN LLP

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James C. Scheller, Jr.
Attorney for Applicant
Registration No. 31,195

12400 Wilshire Boulevard
Seventh Floor
Los Angeles, CA 90025-1026
(408) 720-8300